



## Attenuation of Deviant Sexual Fantasy across the Lifespan in United States Adult Males

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Deviant sexual fantasy is identified as a risk factor for sexual offending, yet no study has examined deviant sexual fantasy across the lifespan in nonoffending adult males. To bridge this gap, this study examined the frequencies of normative and deviant sexual fantasies among 318 nonoffending adult males in the United States. Participants were recruited via Amazon Mechanical Turk<sup>TM</sup>. Participants took two inventories that assessed demographics and types of sexual fantasies. Normality tests, means tests, Kruskal–Wallis 1-way analyses of variance (ANOVAs), binary logistic regressions, and odds ratio post hoc analyses were conducted. Deviant sexual fantasies progressively declined across all three age groups, while normative sexual fantasy did not. Results suggest that deviant sexual fantasy changes across the lifespan. Applicability of the findings to applied settings, such as sexually violent predator evaluations, is discussed. Limitations and future considerations are addressed.

**Key words:** Deviant; fantasy; interest; lifespan; males; nonoffending; normative; sexual; sexual offending; United States.

Sexual violence remains a significant problem within the United States (Pereda, Guilera, Forns, & Gómez-Benito, 2009; Smith et al., 2017). Given the scope of this problem, researchers work to identify risk factors for sexually abusive behavior. One variable that has been consistently linked to sexual reoffending is deviant sexual interest (Craig, Browne, Stringer, & Beech, 2005; Hanson & Bussiere, 1998). However, the mechanism by which deviant sexual interest precipitates sexual recidivism is not well understood. Research suggests that sexual interest in general has an inverse relationship with age, with declines in sexual interest observed in older

adulthood (Giambra, 1974; Halderman, Zelhart, & Jackson, 1985; Lindau et al., 2007). However, little is known about the frequency and types of deviant sexual fantasy across the lifespan as well as how this attenuation is related to sexual reoffending.

### Factors that influence sex offending

#### *Sexual arousal patterns*

Men experience a decline in testosterone production as they enter late adulthood. This decline in testosterone can begin as early as 40 years of age (DeLamater & Friedrich, 2002) and lowers sexual arousal in males

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This article has been corrected with minor changes. These changes do not impact the academic content of the article.

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(Bancroft, 2005). Sexual arousal has found to attenuate with age due to a variety of factors such as sexual disorders, the onset of medical disorders or diseases, and side effects of psychopharmacological treatment. Commonly reported factors, including diabetes, high blood pressure, cardiovascular disease, arthritis, depression, stress, reproductive organ cancers (DeLamater & Moorman, 2007; DeLamater & Sill, 2005; Johannes et al., 2000; Kalra, Subramanyam, & Pinto, 2011; Keil, Sutherland, Knapp, Waid, & Gazes, 1992) and antiandrogen treatment for prostate cancer, can also reduce sexual drive and cause erectile dysfunction in males (Marumo & Murai, 2001). Previous studies (e.g. Barbaree, Blanchard, & Langton, 2003; Blanchard & Barbaree, 2005) support the attenuation of sexual arousal in adult males who sexually offend. For example, Blanchard and Barbaree (2005) found in their study of male pedophiles, hebephiles and teleiophiles that the amplitude of penile response declines steeply from adolescence to around age 30, after which penile response declines at a slower rate. Additionally, Hall's (1991) study of 169 male sex offenders between the ages of 20–66 years supports that sexual arousal was inversely related to chronological age.

### ***Cognitive distortions***

First introduced by Abel, Becker, and Cunningham-Rathner (1984) to label the justifications used by individuals in their sample who offended against children, cognitive distortions are attitudes and/or beliefs that offenders utilize to minimize and rationalize their offending behavior (Blumenthal, Gudjonsson, & Burns, 1999). Offense-supportive beliefs endorsed by some sex offenders include that children are sexual autonomous beings; that only forceful, sexual behavior is harmful to children; that sexually abusive behaviors are outside of the offenders' control; the offender is entitled to obtain sexual gratification; and that adults are more threatening than children (Ward & Keenan,

1999). Women-specific cognitive distortions endorsed by offenders include that women are dangerous and are also sexual objects (Polaschek & Gannon, 2004). Researchers have previously documented that cognitive distortions serve to maintain sexual offending behavior. Ward and Keenan (1999) assert that these distorted cognitions serve as frameworks for implicit theories about their victims' desires and their beliefs. Their victims' behavior is interpreted in order to be accepted, rejected or changed to fit their implicit theories (Ward & Keenan, 1999), thereby serving to maintain their cognitive distortions about their victim. For example, an individual who sexually offends may believe that children are sexually attractive as well as sexually motivated, thus intercourse with the child serves to meet the child's perceived sexual needs (D'Urso, Petrucci, Costantino, Zappulla, & Pace, 2019). Thus, the offender's sexual offending behavior will continue as offense-supportive cognitions are unlikely to change unless met with consistent, contradictory evidence (Ward & Keenan, 1999). Another important factor found to influence sex offending is deviant sexual interest.

### **Deviant sexual interest, deviant sexual fantasy and sexual offending**

*Deviant sexual interest* is defined as an enduring sexual attraction to sexual acts that are illegal (e.g. rape, sex with children) or highly unusual (e.g. fetishism; Hanson & Morton-Bourgon, 2005). Due to the overlapping nature of deviant sexual interest and paraphilia definitions, deviant sexual interest in this study includes those sexual interests that are paraphilic. *Deviant sexual fantasy* can be defined as sexual fantasy imagery that contains acts of inflicting harm upon another or illegal experiences (Chick & Gold, 1987; Crépault & Couture, 1980; Gee, Devilly, & Ward, 2004). Among nonincarcerated individuals, general sexual interests and fantasies are more commonly reported than deviant sexual

fantasies. Specifically, 94% of males in the general population report experiencing general sexual fantasies (Davidson, 1985) while fewer than 2% of men report experiencing deviant sexual fantasies (Joyal, Cossette, & Lapierre, 2015), such as imagining being raped by a woman, seducing a woman who pretended to resist, raping a woman and beating a woman, while infrequent deviant sexual fantasies endorsed were bestiality, sadism and transvestism (Crépault & Couture, 1980; Joyal et al., 2015; Rokach, 1990; Williams, Cooper, Howell, Yuille, & Paulhus, 2009). However, several studies found that 7–19% of adult males reported interest in having sex with a child if they could avoid detection and imprisonment (Briere & Runtz, 1989; Hayashino, Wurtele, & Klebe, 1995; Wurtele, Simons, & Moreno, 2014).

### ***Sex offenders***

Prevalence rates of deviant sexual interest among individuals who sexually offend varies based upon the age and type of offender. For example, a study of deviant sexual fantasies in adult male individuals convicted of sexual offenses found that 25% of the sample reported deviant sexual fantasies (Langevin, Lang, & Curnoe, 1998). In particular, in a sample of incarcerated child molesters, rapists and nonsexual offenders, child molesters reported the highest rate of interest in having sex with children as compared to rapists and laypersons (Hayashino and colleagues, 1995).

Compared to other types of offenders, sexual recidivism rates for those who have committed sexual offenses are relatively low, with 14% of those who commit sexual offenses sexually reoffending over a five-to-six-year follow-up period (Hanson & Morton-Bourgon, 2005) and 6–17% of those convicted of a sexual offense sexually recidivating (Bench & Allen, 2013; Craig, 2011; S. R. Gray et al., 2015; Hanson, 2002; Miller, 2015; Nicholaichuk, Olver, Gu, & Wong, 2014; Skelton & Vess, 2008; Zgoba & Simon, 2005). Despite a relatively low sexual

reoffense rate, deviant sexual interest is consistently identified as one of the best predictors of sexual reoffending amongst those individuals who sexually offend (Allan, Grace, Rutherford, & Hudson, 2007; Craig, Thornton, Beech, & Browne, 2007; Hanson & Bussiere, 1998; Hanson & Morton-Bourgon, 2005; Kenny, Keogh, & Seidler, 2001; Mann, Hanson, & Thornton, 2010; Rice, Harris, Lang, & Chaplin, 2008; Roberts, Doren, & Thornton, 2002; Stephens, Cantor, Goodwill, & Seto, 2017; Turner, Hoyer, Schmidt, Klein, & Briken, 2016). For example, Seto and colleagues' (2004) study of deviant sexual interest scores on the Screening Scale for Paedophilic Interests (SSPI) found that scores were significantly associated with violent recidivism in a sample of 258 adult male offenders convicted of sexual crimes and sexual recidivism (Seto, Harris, Rice, & Barbaree, 2004). Despite the low sexual recidivism rate for sex offenders, it is important to study deviant sexual interest due to its implications for reoffending, particularly how deviant sexual interest attenuates with age.

### **Attenuation of sexual interest and sexual fantasy**

Related literature reveals that general sexual interest declines with age in men (Ahn, Park, & Lee, 2002; Fugl-Meyer & Fugl-Meyer, 1999; Schiavi & Rehman, 1995) for various reasons. For example, a cross-cultural study of sexual interest in 5255 adult males found that the reported reasons for participants' decline in sexual interest included tiredness, work-related stress, relationship-related stress, frequency of masturbation, pornography usage, lack of attraction towards one's partner, low body image and health problems (Carvalho, Træen, Stulhofer, 2014). In particular, daily sexual fantasies decrease with age for adult males. A study of sex, romance and sexuality in older adults found that over 50% of adult males in their fifties experienced daily sexual fantasies, which dropped to 42%

in their sixties, and to 27% for those in their seventies (Schwartz, 2010). While previous literature explains why sexual interest and sexual fantasy wane in older adulthood in the general population, no current research explains why sexual interest (specifically sexual fantasy) attenuates in older individuals who sexually offend.

Additionally, no singular theory currently explains the underlying processes of deviant sexual fantasy (Bartels & Beech, 2016) nor whether deviant sexual fantasy declines in adulthood. Abel and colleagues' (1974) study was the first to posit that deviant sexual fantasy is a dynamic risk factor in precipitating sexual offending, which has been identified in preceding theories, particularly in Ward and Beech's (2016) modified integrated theory of sexual offending (ITSO). Ward and Beech's ITSO proposes that deviant thoughts and fantasies as well as deviant arousal are dynamic risk factors that are likely to precipitate sexual offending. Specifically, deviant sexual fantasy and sexual interest drive sexual arousal to produce and maintain sexual offending behavior (Ward & Beech, 2016). While Ward and Beech's updated theory accounts for the relationship between deviant sexual fantasy, deviant sexual interest and sexual offending, no current sex-offending theory addresses how aging influences deviant sexual fantasy and deviant sexual interest, as well as its impact on offending behavior. Thus, the current study proposes, based on Ward and Beech's (2016) modified ITSO theory and the general sexual interest literature, that deviant sexual fantasy, much like general sexual interest, declines in older adulthood.

### The current study

Although deviant sexual fantasy has been explored in the sex offending literature, the frequency of deviant sexual fantasy throughout adulthood is unknown. Given that deviant sexual fantasy has been shown to be one of the best predictors of sexual recidivism (Hanson & Bussiere, 1998; Skye, Cantor, Goodwill, &

Seto, 2017), it is important to understand how this may change with age. Thus, this study aims to clarify whether deviant sexual fantasy declines throughout adulthood. Therefore the overarching goal of the current research was to utilize a cross-sectional design to examine whether normative and deviant fantasies attenuate across three age groups of nonoffending males. Based upon the ITSO and the general sexual interest literature on aging, in which general sexual interest declines in adult males with age (Ahn et al., 2002; Fugl-Meyer & Fugl-Meyer, 1999; Schiavi & Rehman, 1995), we hypothesized that:

H1 – Normative sexual fantasies were expected to progressively decrease across the three age groups, from youngest to oldest.

H2 – Deviant sexual fantasies were expected to progressively decrease across the three age groups, from youngest to oldest.

H3 – Deviant fantasies, across all three age groups, were expected to be infrequent in this study.

## Method

### Procedure

After obtaining approval from the authors' institutional review board, participants were recruited via Human Intelligence Task (HIT) postings on Amazon Mechanical Turk<sup>TM</sup> (MTurk<sup>TM</sup>), with each posting featuring a link to the survey hosted on Survey Monkey<sup>TM</sup>'s website. MTurk<sup>TM</sup> is a crowdsourcing platform where 'workers', or participants, are recruited by 'requesters', or investigators, for the execution of small or large tasks known as 'HITs' in exchange for financial compensation (Paolacci, Chandler, & Ipeirotis, 2010). The MTurk<sup>TM</sup> recruitment message described the study as 'Examining sexual fantasy across the lifespan'. Participant eligibility criterion for this study were that they had to be male, 18 years of age and older, and residing within the United States. Participants were required

to read and sign an informed consent form by clicking that they acknowledged the online consent form before beginning the study. After completing the approximately 30-min survey, which included a demographic questionnaire, the Sexual Fantasy Frequencies Questionnaire (SFFQ) and the Sexual Fantasy Questionnaire (SFQ; Kaufman, 1993), participants had to acknowledge that they had been debriefed about the study. MTurk<sup>TM</sup> participants were awarded \$1.00 for participating in this study.

### Participants

A total of 343 male participants between the ages of 18 and 76 years were recruited from the general population for the current study. Participants in this study were 'Turkers' or 'Workers' on Amazon's Mechanical Turk (MTurk<sup>TM</sup>). Only Turkers who resided within the United States were included in this study as culture influences type and frequency of sexual fantasy (Wu, Ku, & Zaroff, 2016). Participants were separated into three strata by age; those aged 18 to 30 years were in the first strata ( $N=102$ ), those between the ages of 31 and 50 years ( $N=137$ ) were in the second strata, and the remaining participants between the ages of 51 and 76 years ( $N=79$ ) were in the third strata. Participants were separated into the three age groups to reflect similar age groupings used in previous studies (Cameron & Biber, 1973; Halderman et al., 1985) that measured general sexual fantasy across age groups. Additionally, participants were sorted into the three age groups in an attempt to meet the parametric assumption of homogeneity of variance.

Most participants in this study identified as white/Non-Hispanic ( $N=259$ ; 81.7%) and were married ( $N=155$ ; 48.8%). Participants in this sample either matriculated from a post-secondary educational institution ( $N=136$ ; 43%) or obtained some postsecondary education ( $N=95$ ; 29.9%). The majority of the sample did not endorse ever having mental health problems ( $N=249$ ; 78.3%). In addition, almost all participants in the sample were not taking medications to increase ( $N=10$ ;

96.8%) or decrease ( $N=1$ ; 0.3%) sexual arousal. Finally, very few participants endorsed nonsexual criminal convictions, with ( $N=30$ ; 9.4%) reporting a conviction for a nonviolent crime and ( $N=3$ ; 0.9%) reporting conviction for a violent crime. Demographic information is presented in Table 1.

### Measures

#### Demographics questionnaire

Participants completed a demographics questionnaire, which included items about race, age, ethnicity, education level, sexual orientation, relationship status, mental health issues and current prescriptions that participants were taking for mental health or sexual arousal. Additional questions were asked pertaining to participant history of nonviolent, violent and sexual offense convictions.

#### Sexual Fantasy Questionnaire (SFQ)

The Sexual Fantasy Questionnaire (N. S. Gray, Watt, Hassan, & MacCulloch, 2003) is a questionnaire that addresses the types and frequencies of normative and deviant sexual fantasies. This questionnaire was created to specifically assess sadistic sexual fantasy but included 'filler' sexual fantasy items that addressed general sexual fantasy ('Sex in public places') and paraphilic fantasy items ('Sex with an animal'; N. S. Gray et al., 2003). As this study's focus was on deviant sexual fantasy, including deviant sexual interest, only 93 of 155 of the SFQ's items were included as they pertain solely to sexual fantasy while the remaining questions referred to behaviors. Items were rated on a 5-point Likert scale from 0 ('Never fantasize') to 4 ('Fantasize about very frequently'). The SFQ demonstrates adequate test-retest reliability ( $r = .82$ ) and internal consistency ( $\alpha = .82$ ), with computed percentage agreement for repeated items 90% (O'Donohue, Letourneau, & Dowling, 1997). Criterion validity was supported for the SFQ as the authors found that offenders in their study scored higher (19,

Table 1. Participants' demographics by number and percentage.

Demographic variable	Participants (Grouped by age)					
	18–30 years		31–50 years		51–76 years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Ethnicity</i>						
White/Non-Hispanic	78	24.6	111	35.0	70	22.1
Black/Non-Hispanic	9	2.8	9	2.8	3	0.9
Hispanic/Latino	8	2.5	8	2.5	3	0.9
American Indian/ Alaskan Native	0	0.0	2	0.6	0	0.0
Asian/Pacific Islander	5	1.6	4	1.3	3	0.9
Middle Eastern	2	0.6	0	0.0	0	0.0
Other	0	0.0	2	0.6	0	0.0
<i>Marital status</i>						
Single	76	23.9	47	14.8	8	2.5
Married	26	8.2	75	23.6	540	17.
Separated	0	0.0	3	0.9	0	0.0
Divorced	0	0.0	12	3.8	15	4.7
Widowed	0	0.0	0	0.0	2	0.6
<i>Highest level of education completed</i>						
Some high school	2	0.6	1	0.3	2	0.6
Graduated high school/GED	16	5.0	9	2.8	7	2.2
Some college	29	9.1	37	11.7	29	9.1
Graduated college	43	13.6	63	19.9	30	9.5
Some graduate school	6	1.9	6	1.9	3	0.9
Completed graduate school	5	1.6	21	6.6	8	2.5
<i>Annual household income</i>						
Under \$9999	23	7.2	4	1.3	2	0.6
\$10,000–\$29,999	30	9.4	28	8.8	24	7.5
\$30,000–\$49,999	21	6.6	30	9.4	18	5.7
\$50,000–\$69,999	17	5.3	40	12.6	14	4.4
\$70,000–\$89,999	9	2.8	20	6.3	10	3.1
\$90,000 or more	2	0.6	15	4.7	11	3.5
<i>Sexual orientation</i>						
Heterosexual	91	28.6	128	40.3	73	23.0
Homosexual	3	0.9	2	0.6	2	0.6
Bisexual	8	2.5	7	2.2	4	1.3
<i>Ever had mental health problems</i>						
Yes	26	8.2	32	10.1	11	3.5
No	76	23.9	105	33.0	68	21.4
<i>Currently taking medications for mental health problems</i>						
Yes	8	2.5	17	5.4	6	1.9
No	93	29.3	120	37.9	73	23.0

(Continued)



Table 1. (Continued).

Demographic variable	Participants (Grouped by age)					
	18–30 years		31–50 years		51–76 years	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<i>Currently taking medications to increase sexual arousal</i>						
Yes	2	0.6	4	1.3	4	1.3
No	100	31.6	132	41.8	74	23.4
<i>Ever been convicted of a nonviolent crime</i>						
Yes	8	2.5	16	5.0	6	1.9
No	94	29.6	121	38.1	73	
<i>Ever been convicted of a violent crime</i>					(23.0)	
Yes	1	0.3	2	0.6	0	0.0
No	101	31.8	135	42.5	79	24.8

Note: *N* = 318.

$SD = 6.46$ ) than students (15,  $SD = 1.53$ ) on the sexual abuse of children scale (Child Scale) on the SFQ (O'Donohue et al., 1997). This measure also demonstrates concurrent validity as a previous study found that sexual deviance measured by the SFQ, including deviant sexual fantasy items pertaining to prepubescent children, rape, sexual assault, torture and so forth, was highly correlated with the Child Molestation subscale score on the Multiphasic Sex Inventory (MSI) (Spada & Jeglic, 2016). A normative sexual fantasy variable was computed containing 56 normative sexual fantasy items from the SFQ. A means test was conducted using the normative sexual fantasy variable across the three age groups. A deviant sexual fantasy variable was computed using 35 deviant sexual fantasy items from the SFQ. A means test was also run with the deviant sexual fantasy variable across the same three age groups. Utilizing themes from previous nonsexual offending samples of the SFQ (Maile, 2015; Spada, 2015), sexual fantasy items were sorted into the following themes: pedophilia, rape, sadism, masochism, non-contact-related offenses, other paraphilias and normal. Means were calculated for each theme and subsequently compared across each age group.

## Results

After initial data screening, 10 participants were excluded as more than 5% of their data were missing. Additionally, one participant was excluded for failing the two attention check questions in the survey, two participants failed to provide their age, and four participants answered 'yes' to being convicted of a sexual offense, as this study's target population was a nonoffending population. Finally, using a cutoff of  $\pm 2.50$  for standardized scores on the SFQ revealed eight MTurk<sup>TM</sup> participants as outliers, and as such these participants were removed from subsequent analyses. Thus, a final sample of 318 males (315 males, 3 transgender males) was utilized for data analyses ( $M = 40.06$  years,  $SD = 14.41$ ).

A means analysis for normative sexual fantasy across all age groups found that all participants endorsed experiencing a normative sexual fantasy, with means for each group following a curvilinear pattern, 18–30 years ( $M = 1.08$ ,  $SD = 0.54$ ), 31–50 years ( $M = 1.15$ ,  $SD = 0.51$ ), and 51–79 years ( $M = 1.04$ ,  $SD = 0.52$ ). Means were also computed for each theme across all age groups, with rape a commonly reported theme across

Table 2. Means of sexual fantasy themes by age group.

Sexual fantasy themes	Age groups					
	18–30 years		31–50 years		51–76 years	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Pedophilia	0.18	0.38	0.24	0.48	0.16	0.32
Rape	0.36	0.65	0.50	0.63	0.30	0.57
Sadism	0.26	0.45	0.25	0.40	0.15	0.34
Masochism	0.28	0.46	0.20	0.37	0.13	0.32
Non-contact-related offenses	0.55	0.66	0.57	0.62	0.42	0.50
Other paraphilia	0.37	0.45	0.30	0.378	0.2	0.38
Normal	1.42	0.65	1.54	0.63	1.39	0.65

Note:  $N = 318$ .

Table 3. Summary of binary logistic regression for normative sexual fantasy.

Predictor	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>W</i>	<i>p</i>
Constant	−21.20	455.06	.00	.00	1.00
Age 18–30 years	16.58	4527.06	15994800.28	.00	1.00
Age 31–50 years	0.00	5678.10	1.00	.00	1.00

Note:  $N = 318$ . *OR* = odds ratio.

all ages, 18–30 years ( $M = 0.36$ ,  $SD = 0.65$ ), 31–50 years ( $M = 0.49$ ,  $SD = 0.63$ ), and 51–79 years ( $M = 0.30$ ,  $SD = 0.57$ ). Means and standard deviations are presented in Table 2.

A Kolmogorov–Smirnov test was conducted to assess for normality, which revealed that the overall sexual fantasy score across all age groups was not normally distributed,  $D(318) = 0.08$ ,  $p \leq .001$ . Thus, the assumption of normality was not met, and nonparametric tests were conducted to test the study hypotheses. A Kruskal–Wallis one-way analysis of variance (ANOVA) was conducted to assess H1. The results revealed there was not a statistically significant difference in normative sexual fantasy between the three age groups,  $\chi^2(2) = 2.118$ ,  $p = .347$ , with a mean rank normative sexual fantasy score of 160.56 for those 18–30 years, 159.00 for those 31–50 years, and 159.00 for those 51–79 years. A binary logistic regression was also conducted to test the contribution of age in predicting presence of

normative sexual fantasy. Results revealed that age was not a significant predictor of normative sexual fantasy,  $\chi^2(2, N = 318) = .00$ ,  $p = 1.00$ , indicating that none of the age groups significantly predicted the presence of normative sexual fantasy. Additional binary logistic regression information for normative sexual fantasy is included in Table 3.

Results for a means analysis of H1 revealed that all participants endorsed experiencing a deviant sexual fantasy, though infrequent comparative to normative sexual fantasy, with means for each group following a negative, nonlinear pattern, 18–30 years ( $M = 0.35$ ,  $SD = 0.39$ ), 31–50 years ( $M = 0.34$ ,  $SD = 0.35$ ), and 51–79 years ( $M = 0.23$ ,  $SD = 0.26$ ). A second Kruskal–Wallis one-way ANOVA was conducted to assess H2. The results from this analysis showed there was a statistically significant difference in deviant sexual fantasy between the three age groups,  $\chi^2(2) = 6.346$ ,  $p = .04$ , with a mean rank deviant sexual fantasy score of 155.38 for



Table 4. Summary of binary logistic regression for deviant sexual fantasy.

Predictor	<i>B</i>	<i>SE</i>	<i>OR</i>	<i>W</i>	<i>p</i>
Constant	−1.02	0.26	0.36	15.91	.00
Age 18–30 years	−0.74	0.38	0.48	3.85	.05
Age 31–50 years	−0.81	0.36	0.45	5.21	.02

Note: *N* = 318. *OR* = odds ratio.

those 18–30 years, 154.05 for those 31–50 years, and 174.27 for those 51–79 years. A second binary logistic regression was conducted to test the contributions of age group on predicting the presence of deviant sexual fantasy. Results revealed that age trended towards significance as a predictor of deviant sexual fantasy,  $\chi^2(2, N = 318) = 6.37, p = .04$ , with the 31–50 years group being significant ( $p = .02$ ) in comparison to the other two groups ( $p = .50$ ). The results of the Cox & Snell and Nagelkerke  $R^2$  estimates indicated that the whole model explained 1.8% to 3.1% of the variance in the presence of deviant sexual fantasy and correctly classified 2.7% of cases. Binary logistic regression information for deviant sexual fantasy is presented in Table 4.

## Discussion

Although previous research has addressed deviant sexual fantasy in the sex offending population (Langevin et al., 1998; Sheldon & Howitt, 2008), no studies have examined deviant sexual fantasy through the lifespan in non-offending adult males. As deviant sexual fantasy has been shown to be one of the best predictors of sexual recidivism (Hanson & Bussiere, 1998; Skye et al., 2017) it is important to understand how this phenomenon may change with age. Thus, this study sought to examine sexual fantasy and age in a nonoffending sample of adult men by assessing what age group (18–30 years, 31–50 years, 51–76 years) influenced what type of fantasy would occur (normative vs. deviant). This study aim was achieved by using a cross-sectional study design utilizing normality tests,

means tests, Kruskal–Wallis one-way ANOVAs, binary logistic regressions and odds ratio post hoc analyses.

## Normative sexual fantasy

Contrary to H1, the results revealed that normative sexual fantasy does not progressively decline with age. Instead, individuals in the 31–50 years age group endorsed the highest means of normative sexual fantasy, followed by those 18–30 years, and those 51–76 years of age. This finding could potentially be explained by internet usage by older adults. Older adults utilize the internet far less than young adults and typically use the internet for a limited purpose such as communicating with others or looking up information about their health (Olson, O'Brien, Rogers & Charness, 2011). Further, older adults report barriers to internet usage including frustrations with the internet, a lack of time to learn computer equipment, physical and mental limitations, mistrust of online privacy and information retrieved from the internet (Gatto & Tak, 2008). As Ward and Beech's (2016) ITSO theory does not fully account for the relationship between normative sexual fantasy and offending behavior in individuals who sexually offend, the literature on sexual interest in the general population is applicable to this study's results. Previous literature on general sexual interest states that sexual interest declines with aging (Ahn et al., 2002; Fugl-Meyer & Fugl-Meyer, 1999; Schiavi & Rehman, 1995), with sexual interest remaining high from adolescence into middle adulthood when sexual interest begins to steadily decline into older adulthood (Cameron & Biber, 1973;

Leitenberg & Henning, 1995; Lindau et al., 2007). This phenomenon could potentially explain why the 31–50 years age group endorsed the most normative sexual fantasies in our study compared to the 18–30 and 51–76 years groups.

### **Deviant sexual fantasy, deviant sexual interest and deviant sexual arousal**

Consistent with H2, the results revealed that deviant sexual fantasy progressively declines with age. Specifically, the 18–30 years group reported the highest mean of deviant sexual fantasy followed by those 31–50, then those 51–76 years of age. Although the results reported that the 31–50 years old group was statistically significant, this finding could be attributed to the platform used to collect participants as most Turkers are in their mid-thirties (Paolacci et al., 2010). Thus, the results may be attributed in part to unequal sample size across age groups.

Another potential explanation for the progressively declining deviant sexual fantasies reported is the attenuation of sexual arousal in adult males. Previous research exists supporting Ward and Beech's (2016) theory that there is a significant relationship between sexual interest and sexual arousal (O'Carroll & Bancroft, 1984). In particular, general sexual interest declines in older adult males, with testosterone levels peaking in early adulthood and decreasing thereafter with age (Denti et al., 2000; Harman, Metter, Tobin, Pearson, & Blackman, 2001; Jankowska, Rogucka, Medras, & Welon, 2000), leading to lowered sexual arousal in males (Bancroft, 2005). For example, in a longitudinal and cross-sectional study of aging, levels of both total and available testosterone were found to decrease from 30 to 90 years of age (Harman et al., 2001). For males that sexually offend, the decline of sexual arousal mirrors that of males in the general population in that sexual arousal declines quickly between adolescence and age 30, with a slow, steady decline after 30 years of age

(Blanchard & Barbaree, 2005). Though we did not assess sexual arousal in our study, this phenomenon could partially account for the progressive decline of deviant sexual fantasies that were reported by the three age groups in our study.

Additionally, a possible explanation for why those under 30 years of age endorsed more deviant sexual fantasies than those over the age of 30 could be due to increased pornography consumption among younger men. Researchers found that pornography consumption has increased since the 1970s, rising from 45% to 61%, with change over time being the smallest for older age groups for which pornography consumption decreases (Price, Patterson, Regnerus, & Walley, 2016). Additionally, in a study of pornography consumption among 4339 Swedish young adults, less than one third of participants reported viewing deviant sexual pornography of violence, animals and children (Svedin, Åkerman, & Priebe, 2011). Although pornography exposure and usage were not assessed in the current study, those under 30 years in our sample could be viewing more pornography, as well as more deviant forms of pornography, than those over the age of 51 years as pornography usage in young adulthood has become more socially accepted (Carroll et al., 2008).

Consistent with H3, deviant sexual fantasy was infrequent across all age groups within our study, particularly in comparison to normative sexual fantasy. This finding is consistent with the sexual fantasy literature in that deviant sexual fantasy is infrequently endorsed by adult males in the general population (Crépault & Couture, 1980; Rokach, 1990; Wilson & Lang, 1981), and that this type of fantasy is statistically uncommon (Joyal & Carpentier, 2016; Joyal et al., 2015) compared to normative sexual fantasy (Davidson, 1985).

### **Limitations and future directions**

Despite the strengths of this study, some limitations warrant future research. First, this study

used a cross-sectional design, which is a one-time measurement of exposure and outcome (Setia, 2016), thus making it difficult to derive causal relationships. Therefore, only associations can be made as opposed to inferring a cause-and-effect relationship. Additionally, this type of design cannot be used to study a variable over time, as it is a one-time measurement of variable(s). Thus, future studies could utilize a longitudinal design to investigate the relationship between age and frequency of normative and deviant sexual fantasy over time, as such studies are suited to evaluating risk factors and accounting for cohort effects (Caruna, Roman, Hernández-Sánchez, & Solli, 2015).

Second, the sampling utilized in this study yielded uneven group sizes, with most participants in the 18 to 30 and 31 to 50 age groups. These differences may have influenced the findings of this study and possibly limit the generalizability of results, as the use of internet-based surveys may possibly exclude those in older age groups. However, the age groupings in this study reflect natural trends, as most Amazon Mechanical Turkers are in their mid-thirties (Paolacci et al., 2010), and the average U.S. adult is approximately 38 years of age (U.S. Census Bureau, 2018). Additionally, internet usage is variable across ages, with usage most common under the age of 50 years (Zickuhr & Madden, 2012). Previous research also suggests that Amazon Mechanical Turk samples are comparative to the general population in terms of such phenomena as prevalence of psychiatric disorders (Shapiro, Chandler, & Mueller, 2013) and political ideology (Clifford, Jewell, & Waggoner, 2015), as well as judgment and decision making (Paolacci et al., 2010). However, future studies should include more participants over the age of 50 years and recruit from settings with a higher concentration of older adults such as assisted living facilities or community centers to increase the representativeness of this sample.

Third, this study consisted of self-report measures, which are susceptible to social

desirability responding (SDR). SDR is the tendency for respondents to portray a positive image of themselves by providing responses that are socially approved and avoiding those that are considered socially undesirable (Alexander & Fisher, 2003; Uziel, 2010). For individuals who commit sexual offenses, there can be a greater motivation to withhold information as disclosing sensitive information such as persisting deviant sexual interest can impact treatment progress and determine the risk of relapse (Moster, Wnuk, & Jeglic, 2008). Although the validity of online survey results due to SDR is concerning (Huang, Bowling, Liu, & Li, 2015; McKibben & Silvia, 2016; Meade & Craig, 2012), a previous study accessing differences in SDR between paper and online surveys have found that this style of responding was similar across both survey types (Dodou & de Winter, 2014). Additionally, previous research reveals that Amazon Mechanical Turkers produce reliable responses (Buhrmester, Kwang, & Gosling, 2011; Casler, Bickel, & Hackett, 2013; Holden, Dennie, & Hicks, 2013) due to increased anonymity regarding the disclosure of their mental health information (Shapiro et al., 2013). Future studies may incorporate a social desirability measure, particularly if working with populations who commit sexual offenses.

Fourth, this study was composed of an all-male sample, and so the results from this study may not be generalizable to females. Previous research has found that females report lower rates of sexual interest than men, especially in middle and late adulthood (Graham et al., 2017; Lindau et al., 2007). Therefore, future studies should endeavor to include both males and females in study samples or possibly target the type and frequency of normative and deviant sexual fantasies for females in the general population. Additional sample concerns include using a sample from the general population, which may be not comparable to sex offending samples as individuals who commit sexual offenses have higher rates of deviant

sexual interest (Blanchard et al., 2006; Hayashino et al., 1995) than the general population. Thus, replication of this study with a sex offending sample is warranted to facilitate comparisons of normative and deviant sexual fantasy frequencies through the lifespan between these two populations.

### Implications

The results of this study provide a first step in understanding the attenuation of deviant sexual fantasy throughout the lifespan for adult males. Documenting the attenuation of deviant sexual fantasy is important because of the relationship between sexual interest and its uses in applied settings, such as sexually violent predator (SVP) civil commitment evaluations. SVP evaluations target individuals convicted of sexual offenses that are considered dangerous to the public and thereby require treatment in a secured psychiatric facility following incarceration (Packard & Levenson, 2006). Criteria that must be met to civilly commit an individual convicted of a sexual crime include a history of sexual offending, a mental abnormality, volitional impairment rendering the offender unable to control their sexual behavior (Kansas v. Hendricks, 1997) and the likelihood of future sexual reoffending (Knighton, Murrie, Boccaccini, & Turner, 2014).

Sexual violence risk is predicted through the assessment of static factors such as previous sexual offense convictions and through actuarial instruments such as the Static-99 (Packard & Levenson, 2006). However, an online study of clinicians who conduct SVP evaluations found that 70% of evaluators reported that dynamic risk factors were essential to SVP civil commitment evaluations (Jackson & Hess, 2007). An identified dynamic risk factor for sex offender sexual recidivism is deviant sexual interest (Hanson & Morton-Bourgon, 2005; Mann et al., 2010; Rice et al., 2008; Roberts et al., 2002), which was the focus of this study. Assessment of

deviant sexual interest across the lifespan in males is important as it has implications for the duration of civil commitment for adult males convicted of sexual offenses. The findings from this study attest to the attenuation of deviant sexual fantasy across the lifespan in adult males. As such, risk of sexual recidivism may be much lower in older males convicted of sexual crimes who have been incarcerated for decades than those males convicted of sexual offenses who are younger and have been recently committed. Assessment of deviant sexual interest can be conducted with the penile plethysmograph (PPG) which is a direct, objective measurement of a male's sexual arousal to normative and deviant sexual stimuli (Tong, 2007). Penile tumescence in adult male individuals who sexually offend, and therefore pedophilic interest, in response to stimuli such as audio descriptions of child sexual interactions or pictures of nude or semi-clothed children has shown to remain constant despite reassessment (Babchishin, Curry, Fedoroff, Bradford, & Seto, 2017).

Additionally, the results from this proposed research could be utilized by counsellors and practitioners to educate adult males who sexually offend about this form of sexual interest. Specifically, the results could be used to inform psychoeducation modules utilized by clinicians as part of sex offending treatment. As individuals who commit sexual offenses are prone to dissimulation (Marshall, Marshall, & Ware, 2009; Ware, Marshall, & Marshall, 2015) and lack transparency in reporting the presence of deviant sexual fantasy, knowing when sexual fantasy attenuates could aid clinicians in encouraging truthful disclosure during treatment. This is important given that full disclosure of sexual fantasy prevalence for a given offender is necessary for effective treatment invention and progress (Barrett, Wilson, & Long, 2003; Jung & Nunes, 2012; Levenson & Macgowan, 2004).

Addressing this needed update to the deviant sexual fantasy literature is important as a minor percentage of individuals who commit

sexual offenses seek treatment for their deviant sexual fantasies. In a sample of convicted males who committed sexual offenses, only 18% sought out treatment for their deviant sexual fantasies (Piché, Mathesius, Lussier, & Schweighofer, 2016) due to feelings of shame and shyness, not knowing who to talk to, having no one to talk to or thinking treatment was unimportant (Piché et al., 2016). Additionally, reported barriers for disclosing problematic deviant sexual fantasies were: concern of being arrested if the offender reported their deviant sexual fantasies, being labelled a sexual deviant and concerns about privacy and anonymity (Piché et al., 2016; Levenson, Willis, & Vicencio, 2017). Due to purposeful withholding of information (Marshall et al., 2009; Ware et al., 2015), individuals who commit sexual offenses are often unwilling to disclose the occurrence of deviant sexual fantasies in treatment. Effective treatment intervention for individuals who commit sexual crimes depends upon offenders admitting deviant sexual fantasies as an inverse relationship has been found between denial and treatment progress (Barrett et al., 2003; Jung & Nunes, 2012; Levenson & Macgowan, 2004). Findings from studies such as this proposed project may provide researchers and mental health professionals information for future research and for the development and/or refinement of current practices in sex offending treatment.

## Ethical standards

### *Declaration of conflicts of interest*

Tiffany A. Harvey has declared no conflicts of interest

Elizabeth L. Jeglic has declared no conflicts of interest

### *Ethical approval*

All procedures performed in this study involving human participants were in accordance with the ethical standards of the Human

Research Protection Program of The City University of New York and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

### *Informed consent*

Informed consent was obtained from all individual participants included in the study.

### *Data availability*

The data that support the findings of this study are available from the corresponding author, T. H., upon reasonable request.

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